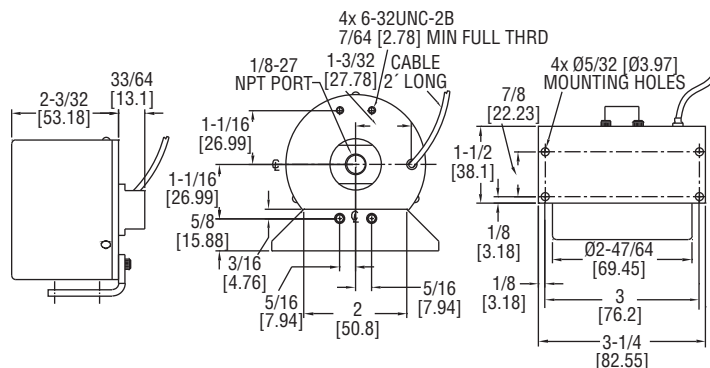




Series HADP High Accuracy Differential Pressure Transmitter

Specifications - Installation and Operating Instructions



The Series HADP transmitter has been carefully calibrated before shipment to you, and it should be handled with the same care given any precision instrument. Pressure range and dimensions are reported on the applicable specifications bulletin.

Ambient Conditions

Do not submerge in liquids, use in ambient conditions corrosive to anodized aluminum, subject to spray or dripping, or use in a high vibration environment. The transmitter is very slightly sensitive to acceleration in the pressure fitting axis. Installation is recommended in the vertical position, with the pressure port downward. This position minimizes damage from drippage of pressure system piping.

Installation of Pressure Fittings

Your transmitter is designed for most accurate operation when subjected to pressures within the designated pressure range. Refer to the specifications for proof pressure limits. Subjection to excessive pressure voids the warranty. **Do not overpressure.**

Standard sealants such as pipe tape generally are satisfactory. For the most sensitive pressure ranges, excessive high torquing of a metal pressure fitting may cause slight zero shift which may be trimmed out using the zero adjustment. Use of a plastic fitting often shows no noticeable zero shift. The torquing effect does not appreciably affect linearity or sensitivity. The wrench flat on the Series HADP should be used when installing the positive pressure fitting.

SPECIFICATIONS

Service: Compatible non-conducting air/gas.

Wetted Parts:

Positive (high) Pressure Port:
Gases compatible with SS, hard anodized 6061 aluminum (Buna-N O-ring);
Reference (low) Pressure Port:
Anodized aluminum, alumina ceramics, gold, fluorocarbon elastomer sealant & Buna-N O-ring.

Accuracy: $\pm 0.14\%$ FS.

Stability: $\pm 0.1\%$ FS over 6 months @ 70°F (21°C).

Pressure Limits: See Model Chart.

Temperature Limits:

Operating: 0 to 175°F (-18 to 71°C);
Storage: -65 to 250°F (-53 to 121°C).

Compensated Temperature Range: 30 to 150°F (-1 to 65°C).

Thermal Effect: $\pm 1.0\%$ FS / 100°F.

Power Requirements: 17 to 42 VDC.

Output Signal: 4 to 20 mA for current models, 0 to 5 VDC for voltage models.

Zero and Span Output:

Zero output: Factory set to within ± 0.07 mA;

Span (FS) output: Factory set to within ± 0.07 mA.

Loop Resistance:

Minimum supply voltage (VDC) = 17 + 0.02 x Resistance of receiver plus line;

Maximum supply voltage (VDC) = 42 + 0.004 x Resistance of receiver plus line.

Zero and Span Adjustments: None.

Response Time: < 5 msec.

Current Consumption: < 30 mA.

Electrical Connections: 2 ft multi-conductor cable.

Process Connections: 1/8"-27 NPT internal (both positive and negative ports).

Mounting Orientation: Pressure port 90° parallel to ground.

Thermal Effects: Max. zero: ± 1.0 (± 1.8); %FS / 100°F (100°C) max.

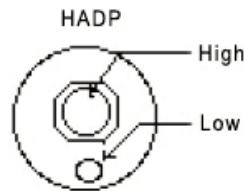
Weight: 8 oz (227 g).

Agency Approval: CE.

A. Positive Pressure Fitting and Media Compatibility

Series HADP: 1/8"-27 NPT internal fitting
For use with gases compatible with stainless steel, hard anodized 6061 aluminum, Buna N "O" ring.

B. Reference Pressure Fitting and Media Compatibility (Differential pressure measurements only.)



Notes:

- (1) Differential pressure models can be used to measure gage pressure by leaving the reference port open to atmosphere.
- (2) Line Pressure refers to pressure applied to both high and low sides of the sensing device simultaneously. Refer to the product data sheet to determine maximum differential pressure and overpressure limits.

Electrical Information for Standard 24 VDC Excitation Pressure Transmitters (nominal)

Connections

Cable Lead	Function
White	Positive Excitation
Yellow	Positive Output
Brown	Negative Output
Black	Negative Excitation - (to circuit ground)
Case	Shield

Electrical

The electrical circuit is equivalent to a 4 terminal network, which can be grounded at only one point, either at the negative excitation or the negative signal output lead, but must not be commoned or grounded at more than one point.

The pressure transmitter must be operated with the case connected either to the negative excitation terminal or to the negative output terminal. Failure to do this may result in damage to or unsatisfactory operation of the unit. This connection may be made by connecting shield and black (negative excitation) leads or alternately by connecting the shield and brown (negative output) leads together. Best shielding against noise will be obtained by connecting the shield and negative excitation (black) leads.

The circuit has internal protection:
Reversed excitation voltage for at least 5 minutes.
Short-circuit or signal output leads.
Short duration power line transients up to 150 volts.

Note on long cable use:

In some instances, use of long cables (several hundred feet length) may introduce enough cable capacitance into the circuit to cause output oscillations. If encountered, this oscillation may be eliminated by connecting a 100 ohm resistor (1/8th watt or larger) in series to each of the output leads at the end of the 2 ft transmitter cable. These series resistors, of course, add to the output resistance.

Electrical

Operation is from a ± 24 VDC supply (common return grounded), and provides you with the negative signal output lead also at the common ground potential. Thus many transmitters can be operated from one power supply into single-ended loads. Circuit is reversed voltage protected for at least 5 minutes. Internal transient suppression network is provided for short duration transients to 150 volts.

Grounding

For general usage and best results (lowest noise) grounding of the shield/case to the black lead is recommended.

Power Supply Advice

This transmitter has been designed to operate from a ± 24 VDC source. The ± 24 V is 24 V above the common power return-lead, and the -24 V is 24 V below the common power return lead.

All three power leads must be connected. The transmitter will not function if just the +24 V and -24 V leads are connected to the power source.

To avoid circuit damage due to excessive voltage, the positive supply voltage should be held within the range of +15 V to +20 V (+22 V to +30 V), and the negative supply voltage should be held within the range of -10 V to -20 V (-10 V to -24 V).

Electrical Information for 4 to 20 mA Pressure Transmitter

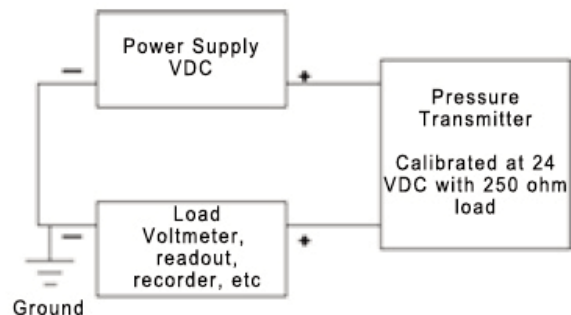
Electrical

The circuit is designed to operate as a true 2-wire 4 to 20 mA pressure transmitter.

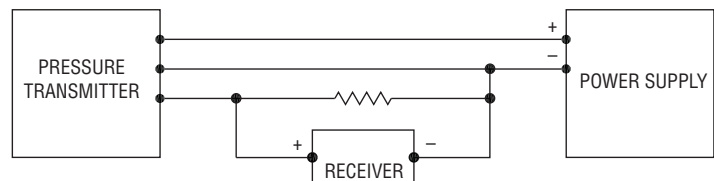
Connection

The transmitter has two electrical leads. These may be connected for current flow in either direction, without change in performance or damage. We suggest that the electrical cable shield be connected to the system loop circuit's ground, thereby improving electrical noise rejection.

Wiring 4 to 20 mA Output



Wiring 0 to 5 VDC Output



Adjustments for Zero and Sensitivity

Adjustments for Voltage Output Pressure Transmitters (cover must be removed)

CAUTION TURN OFF EXCITATION POWER DURING COVER REMOVAL OR REPLACEMENT

Zero Pressure Output

Can be adjusted to zero by potentiometer as shown in diagram. Unit factory adjusted to zero output (± 10 mV).

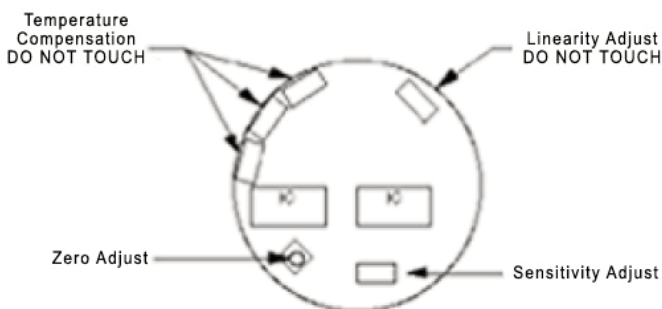
Sensitivity (span)

Can be adjusted by potentiometer as shown on outline diagram. Unit factory adjusted to order specifications.

Linearity - DO NOT TOUCH

Factory adjusted for best linearity. Touching any adjustments other than zero output or sensitivity may necessitate recalibration.

Note: Sensitivity (span) adjustment is not recommended unless a primary pressure standard (dead weight tester, etc.) is available for use as a reference.



Adjustments for Current Output Pressure Transmitters (cover must be removed)

Zero Pressure Output

Zero output can be adjusted ± 0.2 mA about the nominal 4 mA. The zero adjustment is the potentiometer shown in the diagram. Changing zero will not change span.

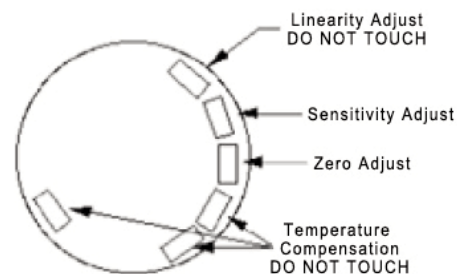
Sensitivity (span)

Sensitivity can be adjusted approximately ± 5 mA from the nominal 16 mA full scale span. The sensitivity adjustment potentiometer is located as shown in the diagram and may be adjusted without affecting linearity calibration.

Linearity - DO NOT TOUCH

Factory adjusted for best linearity. Touching any adjustments other than zero output or sensitivity may necessitate recalibration.

Note: Sensitivity (span) adjustment is not recommended unless a primary pressure standard (dead weight tester, etc.) is available for use as a reference.



MAINTENANCE

Upon final installation of the Series HADP Differential Pressure Transmitter, no routine maintenance is required. A periodic check of system calibration is recommended. The Series HADP is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

Chart A

Model	Range in w.c.	Max Pressure High	Max Pressure Low
HADP-UV-00	0 to 0.5	5 psi	2.5 in w.c.
HADP-UV-01	0 to 1	7 psi	5 in w.c.
HADP-UV-02	0 to 2.5	10 psi	12.5 in w.c.
HADP-UV-03	0 to 5	20 psi	25 in w.c.
HADP-UV-04	0 to 15	50 psi	75 in w.c.
HADP-UV-05	0 to 30	50 psi	150 in w.c.
HADP-UC-00	0 to 0.5	5 psi	2.5 in w.c.
HADP-UC-01	0 to 1	7 psi	5 in w.c.
HADP-UC-02	0 to 2.5	10 psi	12.5 in w.c.
HADP-UC-03	0 to 5	20 psi	25 in w.c.
HADP-UC-04	0 to 15	50 psi	75 in w.c.
HADP-UC-05	0 to 30	50 psi	150 in. w.c.
HADP-BV-08	0 to ± 0.25	5 psi	2.5 in w.c.
HADP-BV-09	0 to ± 0.5	7 psi	5 in w.c.
HADP-BV-10	0 to ± 1	10 psi	12.5 in w.c.
HADP-BV-11	0 to ± 2.5	20 psi	25 in w.c.
HADP-BV-12	0 to ± 7.5	50 psi	75 in w.c.
HADP-BV-13	0 to ± 15	50 psi	150 in w.c.
HADP-BC-08	0 to ± 0.25	5 psi	2.5 in w.c.
HADP-BC-09	0 to ± 0.5	7 psi	5 in w.c.
HADP-BC-10	0 to ± 1	10 psi	12.5 in w.c.
HADP-BC-11	0 to ± 2.5	20 psi	25 in w.c.
HADP-BC-12	0 to ± 7.5	50 psi	75 in w.c.
HADP-BC-13	0 to ± 15	50 psi	150 in w.c.
Model	Range psid		
HADP-UV-06	0 to 5	75 psi	25 psi
HADP-UV-07	0 to 10	100 psi	50 psi
HADP-UC-06	0 to 5	75 psi	25 psi
HADP-UC-07	0 to 10	100 psi	50 psi
HADP-BV-14	0 to ± 2.5	75 psi	25 psi
HADP-BV-15	0 to ± 5	100 psi	50 psi
HADP-BC-14	0 to ± 2.5	75 psi	25 psi
HADP-BC-15	0 to ± 5	100 psi	50 psi

Note: HADP-XV-XX is for voltage, and HADP-XC-XX is for current.